Electronic Version
Stylesheet Version v1.1.1

Claims

[c1] 1. An electrical structure, comprising:
a fuse, a protection plate, a first dielectric layer, and a second dielectric layer, wherein the electrical structure exists within a semiconductor device, wherein the protection plate exists within the first dielectric layer, wherein the second dielectric layer is formed over the protection plate and the first dielectric layer, wherein the fuse is formed over the second dielectric layer, wherein the fuse is adapted to be cut with a laser beam, wherein the dielectric constant of the second dielectric layer is greater than the dielectric constant of the first dielectric layer, and wherein the protection plate is adapted to shield the first dielectric layer from energy from the laser beam.

[c2] 2. The electrical structure of claim 1, further comprising a third dielectric layer below the first dielectric layer, wherein at least one structure exists within the third dielectric layer, wherein the dielectric constant of the second dielectric layer is greater than the dielectric constant of the third dielectric layer, and wherein the protection plate is further adapted to shield third dielectric layer

and the at least one structure from the energy from the laser beam.

[c3] 3. The electrical structure of claim 2, wherein the at least one structure is selected from the group consisting of a conductive line and an electrical component.

[c4] 4. The electrical structure of claim 1, wherein the fuse comprises a first material, wherein the protection plate comprises a second material, and wherein the first material and the second material are not a same material.

[c5] 5. The electrical structure of claim 4, wherein a first product of the reflectivity, thermal capacity, and thermal conductivity of the first material is less than a second product of the reflectivity, thermal capacity, and thermal conductivity of the second material.

[c6] 6. The electrical structure of claim 5, wherein a ratio of the second product to the first product is at least 2:1.

[c7] 7. The electrical structure of claim 4, wherein the first material is tungsten, and wherein the second material is copper.

[c8] 8. The electrical structure of claim 1, wherein the dielectric constant of the first dielectric layer is in a range of about 1 to about 4.

[c9] 9. The electrical structure of claim 1, wherein the second dielectric layer comprises a material selected from the group consisting of SiO_2, Si_3N_4, Fluorinated Silicate Glass (FSG), and Tetraethoxysilane (TEOS).

[c10] 10. The electrical structure of claim 1, wherein the first dielectric layer comprises a material selected from the group consisting of SiLK®, JSR Micro owned spin-on materials, $Si_wC_xO_yH_z$, porous glasses, porous polymers, OLE_LINK1and highly fluorinated polymer .

[c11] 11. A method for forming an electrical structure, comprising:
forming a first dielectric layer within a semiconductor device;
forming, with a damascene process, a protection plate within the first dielectric layer;
forming a second dielectric layer over the protection plate and the first dielectric layer;
and
forming a fuse element over the second dielectric layer, wherein the fuse element is adapted to be cut with a laser beam, wherein the dielectric constant of the second dielectric layer is greater than the dielectric constant of the first dielectric layer, and wherein the protection plate is adapted to shield the first dielectric layer from energy

from the laser beam.

[c12] 12. The method of claim 11, further comprising forming a third dielectric layer below the first dielectric layer, and forming, with a damascene process, at least one structure within the third dielectric layer, wherein the dielectric constant of the second dielectric layer is greater than the dielectric constant of the third dielectric layer, and wherein the protection plate is further adapted to shield the at least one structure and the third dielectric layer from the energy from the laser beam

[c13] 13. The method of claim 12, wherein the at least one structure is selected from the group consisting of a conductive line and an electrical component.

[c14] 14. The method of claim 11, wherein the fuse element comprises a first material, wherein the protection plate comprises a second material, and wherein the first material and the second material are not a same material.

[c15] 15. The method of claim 14, wherein a first product of the reflectivity, thermal capacity, and thermal conductivity of the first material is less than a second product of the reflectivity, thermal capacity, and thermal conductivity of the second material.

[c16] 16. The method of claim 15, wherein a ratio of the sec-

ond product to the first product is at least 2:1.

[c17] 17. The method of claim 14, wherein the first material is tungsten, and wherein the second material is copper.

[c18] 18. The method of claim 11, wherein the dielectric constant of the first dielectric layer is in a range of about 1 to about 4.

[c19] 19. The method of claim 11, wherein the second dielectric layer comprises a material selected from the group consisting of SiO_2, Si_3N_4, Fluorinated Silicate Glass (FSG), and tetraethoxysilane (TEOS).

[c20] 20. The method of claim 11, wherein the first dielectric layer comprises a material selected from the group consisting of SiLK®, JSR Micro owned spin-on materials, $Si_wC_xO_yH_z$, porous glasses, porous polymers, and highly fluorinated polymer.